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OPTIMISING THE HEALTH OF PEOPLE IN ROAD INJURY COMPENSATION PROCESSES: WHAT IS THE ROLE OF REGULATORS AND INSURERS?

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ABSTRACT

Although compensation and rehabilitation schemes exist to assist health and recovery of people injured in road crashes, evidence shows they can also have a negative impact on the health and wellbeing of injured people. Some compensation system elements, including complicated and adversarial claims processes, poor communication between claims managers and injured people, and prioritisation of financial viability of the system rather than health of individuals, can result in lower levels of perceived fairness and poorer health among injured people. Ironically, these same policy and management actions designed to protect the viability of the system can also result in poorer overall system performance. To ensure injury compensation and rehabilitation systems perform their important role as facilitators of recovery for injured people, we suggest they should focus on i) a fundamental shift away from a ‘defensive’ approach prioritising short-term financial targets toward a proactive model of client recovery, ii) improving communication in claims management and medical assessment processes, and iii) introducing less adversarial aspects of overall scheme design. Together, it is suggested these elements can assist to improve health of injured people and the overall performance of injury rehabilitation and compensation systems.

Keywords: Insurance; Health; Recovery; Traffic injuries; Motor vehicle crash

INTRODUCTION

In this chapter we describe the role of injury compensation and rehabilitation systems in optimising the health of people in road injury compensation and rehabilitation processes. The chapter is divided into three parts. In part I, the role and impacts of compensation and rehabilitation systems are described. We discuss the potential and importance of compensation systems in relation to the WHO Decade for Action for Road Safety (§1), and the challenges of operating schemes set up under these various frameworks when viewed from the perspective of trying to produce ‘high performance’ health systems as judged by WHO criteria (§2). Part II addresses the effect of compensation systems on health. This part involves the compensation scheme structures and coverage (§3), a discussion of the literature investigating compensation and rehabilitation system design affecting behaviour and consequently the performance of schemes (§4), and the policy and claims management changes influencing scheme performance and the outcomes (§5). In part III, we work towards an ideal compensation & rehabilitation system. This part holds the methodological limitations, advances and implications to test policy and management scenarios (§6), and a summary of best practice scheme design based on presented information, and existing knowledge of schemes from a theoretical and practical perspective and presentation of an ‘ideal’ scheme schematic and description (§7). The chapter is finalised with a conclusion (§8).

THE ROLE AND POSITION OF COMPENSATION SYSTEMS

1. Road safety, health care and compensation systems

In the twenty years between the 1950’s and 1970’s, private motor vehicle travel tripled across the North America, Europe and Australasia. Whilst this era revolutionised population mobility, it also brought considerable social challenges, including a significant human and financial toll generated by road deaths and injuries. Though many western countries have since witnessed general declines in the rate of road death and injury per capita since these peaks, globally, road trauma continues to climb. Today, more than 1.25 million people are killed, and a further 50 million people are injured in road crashes around the world each year (World Health Organization, 2009). Rapid motorisation throughout China, India and African nations sees road trauma poised to become the world’s fifth leading cause of disability by 2030 (World Health Organization, 2013). Whilst the uptake of private motor vehicles continues apace in these developing nations, without the creation of adequate injury insurance, compensation and rehabilitation services, people injured in road crashes may face significant and ongoing physical, psychological and financial hardship. Further, without the development of such services, existing health and transport systems that need to cope with this emerging burden will come under increasing stress (World Health Organization, 2016).

Fundamentally, road injury insurance, compensation and rehabilitation services developed in response to a problem; one caused by the uptake and sometimes side-effects of high-speed,

private motorised transport. Road trauma began to place such demands on existing health system resources that countries and jurisdictions were forced to develop dedicated road injury schemes and systems funded through insurance premiums. In Australia and many other nations where the population of motor-vehicles continues to rival the population of people (Australian Bureau of Statistics, 2017), these schemes collectively gather and distribute over US\$4 billion in emergency, hospital, and rehabilitation costs for the nearly 1300 people who are killed and 50,000 people who are injured each year.

When designed and operated well, road injury insurance, compensation and rehabilitation systems play a critical role in protecting and rehabilitating injured people while ensuring transport and health systems are able to continue to operate and perform effectively. Indeed, whilst globally renowned for its pioneering and hard-hitting road safety commercials that first began airing in the 1980's, the Transport Accident Commission in the Australian state of Victoria has expressed a recent goal of becoming the 'world's leading social insurer' (Victorian Transport Accident Commission, 2016). But ultimately, what will that mean? What benchmarks for revenue, prevention, operation, treatment, support and outcomes for injured clients and the community at large will lead system administrators to consider they have achieved this goal? These are important questions as the targets that systems set themselves, and the structures they set up to achieve them, have significant implications for the health of millions of people who potentially interact and pass through such systems each year. When structured and delivered well, injury compensation and rehabilitation systems can provide injured people with the support and assistance required to return to their pre-injury lives and levels of productivity. However, when delivered poorly, they can also have undesired, negative effect on recovery and ultimate post-injury health outcomes.

The years 2011 to 2020 have been nominated by the World Health Organization as the 'Decade of Action for Road Safety' (United Nations Road Safety Collaboration, 2011). This focus provides an unprecedented opportunity for countries to develop robust, systems-oriented approaches to tackle the decade's five underlying pillars: 1) Road Safety Management, 2) Safer Roads, 3) Safer Vehicles, 4) Safer Road Users, and lastly 5) Post-Crash Response systems, including compensation, health, and rehabilitation systems (World Health Organization, 2016). However, while models for road safety management, safer roads, vehicles and road users abound, comprehensive understanding of what elements combine to distinguish between high and low performance post-crash response systems (Pillar 5) is lacking. Countries and jurisdictions in the midst of designing, developing, or re-imagining their own systems require readily agreed-upon models and themes upon which to construct their own systems. In this chapter, we seek to provide such guidance.

2. Challenges of managing and operating injury compensation and rehabilitation systems

Considerable effort has been spent during the past two decades to create common frameworks for assessing health system performance, of which compensation and rehabilitation systems are a part. These have focused on understanding the boundaries of health system responsibilities,

the functions they perform, and how these functions translate into achievement of health system goals and outcomes (Duckett & Willcox, 2015; Murray & Evans, 2006). In essence, health systems are required to balance multiple objectives, which may not always be compatible.

A useful framework for understanding the challenges facing management and operation of health systems comes from Murray and Frenk (2000) who describe the functions of health systems as comprising stewardship, resource creation, financing, and service provision. Core goals of the health system are then defined as improved performance across three areas: 1) responsiveness to community expectations, 2) fairness in financial contributions (personal and population), and 3) overall population health (See Figure 1). The World Health Organization (2000) considers that combined high levels of performance across these three elements is indicative of a well-functioning health care system.

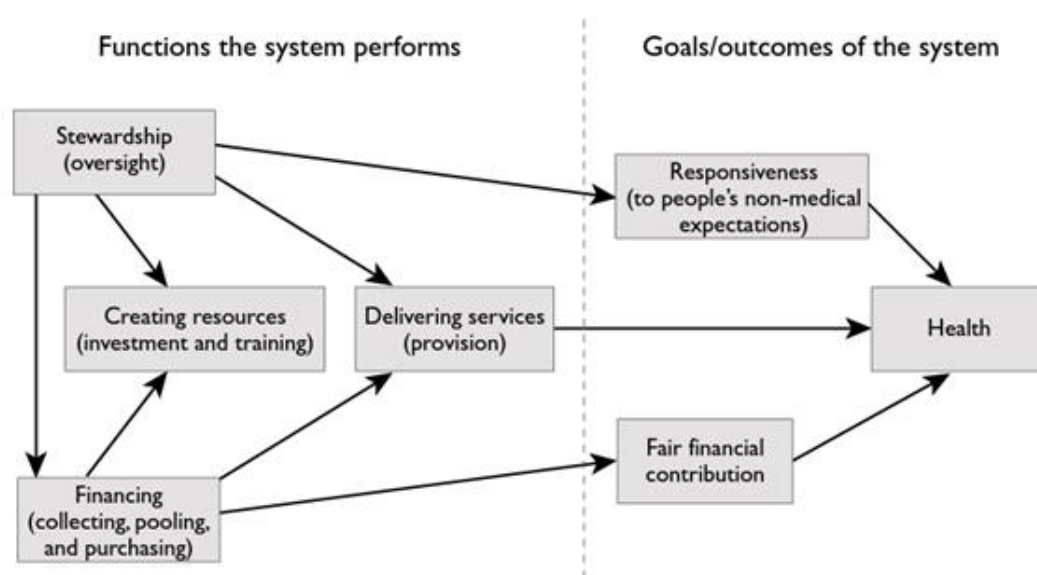


Figure 1. Conceptual model of health system performance as defined by Murray & Frenk, 2000 and adopted by the World Health Organization (2000).

That insurance, compensation and rehabilitation systems should have a primary goal of ‘improving health’ of injured clients seems obvious. However, this goal is not always straightforward when debate over the potentially iatrogenic nature of many individual health system structures and procedures remain. For example, debate continues regarding the relative harms and benefits of both breast and prostate cancer screening (Bell et al., 2014; The, 2012), as well as in the delivery of psychotropic medication for illness such as schizophrenia and depression (Correll, Detraux, De Lepeleire, & De Hert, 2015). Indeed, the provision of ‘healthcare’ itself remains a cause of significant ill-health (Greenfield et al., 2015). Compensation and rehabilitation systems are not immune from such concerns, with researchers having previously argued that the negative effects of receiving health services through injury compensation schemes are consistent enough to be compared to the consistency of relationship between smoking and lung cancer (Gabbe, Harris, Collie, & Cameron, 2010).

However, regardless of actual outcomes, it is at least not an overt goal of road injury insurance, compensation and rehabilitation systems to purposefully create poorer health among already vulnerable, injured people. It also makes little sense that communities would continue to financially, culturally, or politically support insurers, governments, or schemes (public or private) that presided over systems that consistently cause harm. Those that do through mismanagement, error, purposeful withholding of benefits, or otherwise often attract significant negative community and/or state attention, leading to interventions including individual review, regulation or in extreme cases, complete system overhaul (Moszynski, 2015; Schoen et al., 2004; Stylianou, 2011).

Whilst few researchers in the area of injury insurance, compensation and rehabilitation systems have specifically identified Murray and Frenk's (2000) health system performance framework, elements contained within its second element, 'responsiveness to expectations', have received considerable attention in recent years under various guises - especially in the area of compensation. Responsiveness to expectations relates to health services that exclude physical or psychological treatment but still contribute to the overall quality of patients' experience of interactions with the health system. What could broadly be described as an extension of 'bedside manner' (M. McCarthy, 2014) to the level of the organisation, Murray and Frenk (2000) described responsiveness as made up of two elements; 'respect for persons', and 'client orientation'. Respect for persons is in turn comprised of respect for dignity, respect for autonomy, and respect for confidentiality. Similarly, client orientation includes components of prompt attention to health needs, provision of basic amenities, access to social support, and patient choice (e.g., of treating physician and/or institution). These elements are also reflected in more contemporary literature regarding the potential direct and indirect benefits of 'patient-centred care' (Fahey & NicLiam, 2014; Richards, Coulter, & Wicks, 2015). Further, and as Figure 1 illustrates, they are also considered to be directly related to improved patient health outcomes.

Whereas a transactional model of health care based on clear hierarchical structures and focus on activities directly related to 'improving health' as defined above has dominated western healthcare throughout the 19th and 20th century, the concept of health system responsiveness, incorporating concepts of patient-centred care (Mead & Bower, 2002), has now moved to the centre of contemporary thought and practice (Coulter, 2002; Richards, Coulter, & Wicks, 2015). Although consensus on exactly what constitutes patient-centred care remains somewhat elusive for theorists (Kitson, Marshall, Bassett, & Zeitz, 2013), there is general agreement that patient-centred and patient-oriented models require health care providers to become more participatory; traditional doctor-patient or administrator-patient power dynamics are therefore exchanged for a model of partnership, emphasising patient empowerment (Anderson & Funnell, 2005) and information exchange between all players in the system. A more interactive, participatory environment affords injured patients the opportunity, within practical limits, to be involved in decision-making and direct their course of treatment. The patient must be provided with options to be engaged, consulted, effectively communicated with and informed of their options. In short, the patient has agency.

Advocates describe the benefits of adopting patient-oriented models as manifold, spanning reduced costs, improved health outcomes, reduced bed-days and time off work, greater general satisfaction with services, greater compliance with treatment, reduced medical errors, and reduced complaints and litigation (Fahey & NicLiam, 2014). However, practical realities remain in relation to the allocation and availability of finite human and financial resources within health care systems that adopt patient-oriented models of care, pressures of which can still displace best intentions to improve responsiveness (Coulter, 2002; Theodosius, 2008). For example, the predictability and structure of workflows for staff can be adversely affected when patient-centred communication protocols are introduced (O'Leary et al., 2016). In industrial medical models where health services are under increasing pressure to process more patients in less time with less money, the introduction of patient-oriented service protocols can be viewed by staff and administrators as inefficient or simply 'politically correct', and therefore face significant barriers (Anderson & Funnell, 2005). Without continued monitoring and explication of resounding benefits of patient-oriented models for patients, staff, and administrators, health systems may return to more rudimentary functions or at least halt progression toward their optimised selves.

Access to 'reasonable' costs of medical services are enshrined in some Australian state legislation for people injured in road traffic accidents (e.g., State Government of Victoria, 2011). Levels of care considered 'reasonable', however have expanded rapidly since the original legislation was introduced, producing a requirement by injury insurers to specifically restrict access to some treatments in order to protect financial viability of the total system. Therefore, although effort is made to acknowledge the importance of health systems' resistance to entertainment of patients' occasional unrealistic service or treatment requests (Murray & Frenk, 2000), it is ultimately uncertain by whose measure 'reasonable' or 'legitimate' expectations should be judged if not by patients, themselves. It is important for injury compensation and rehabilitation services to therefore have a comprehensive understanding of the circumstances under which particular treatments or service requests will be accepted or denied, due to insufficient evidence of efficacy, cost, precedent, or otherwise.

Community expectations of services are therefore not static at either an individual or population level, but may change over time in response to changing community demand, population norms, attributions of injury, levels of health, evidence, demographic characteristics, and time spent interacting with health services (Elbers et al., 2016; Thompson, Berk, O'Donnell, Stafford, & Nordfjaern, 2015). Despite such restrictions, the legislation is still subject to interpretation, and expectations continue to be re-set by precedent through processes of dispute resolution (O'Donnell, 2000) or tested in the courts when agreement between patients and the health system stewards reaches an impasse. Further, adversarial or simply unsatisfactory communication with health services or staff may have the effect of reducing trust and satisfaction more generally (Elbers, Akkermans, Lockwood, Craig, & Cameron, 2015; Fitzharris, Liu, Shourie, & Collie, 2013; Grant, O'Donnell, Spittal, Creamer, & Studdert, 2014; Grant & Studdert, 2009; Vincent, Phillips, & Young, 1994) leading to further future negative interactions.

Such dynamic relationships between patient expectations and health care systems' consequent responsiveness to changing community interpretations of 'reasonableness' suggests the existence of feedback loops that, without intervention, may drive patient expectations and health system responses ever higher. Conversely, these same feedback loops can act to drive total health system performance lower as systems seek to restrict costs through increased denial of services, reduce in-flow of clients through increasing barriers to entry, and reducing the cost of individual treatments or payments for non-medical compensation (e.g., common-law payments). Rightly or wrongly, such expectations can be encouraged by plaintiff solicitors whose roles as advocates for payment of reasonable damages to clients can create conditions for the development of adversarial relationships between clients and services that hinder both the speed and quality of client recovery. Added to the already poorer physical and mental health recoveries are lower levels of satisfaction experienced by clients who attribute responsibility for their accident to others (Elbers, Collie, & Akkermans, 2015; Gabbe et al., 2015; Thompson, Berk, O'Donnell, Nordfjaern, & Stafford, 2014; Thompson et al., 2015; Thompson, O'Donnell, Stafford, Nordfjaern, & Berk, 2014). All measures possible should be considered to reduce the negative impact of drawn-out adversarial relationships on clients; for whom the relative size of financial compensation also appears to provide little relief.

Injury insurance, compensation, and rehabilitation systems are sub-components of the healthcare system. Consistent with WHO frameworks described above, they must balance responsiveness of the system to clients' expectations alongside the financial viability of the system to optimise health outcomes for the broader population. These final years of the Decade of Action for Road Safety present an opportunity to optimise the design of compensation and rehabilitation systems. This focus could set in train conditions for optimising the physical, mental and functional health of injured clients, improving responsiveness of systems to clients' non-medical needs, and ensure their ongoing financial viability.

II. THE EFFECT OF COMPENSATION SYSTEMS ON HEALTH

It was stated above that injury compensation and rehabilitation systems can provide injured people with the support and assistance to return to their pre-injury lives, but that they can also have an undesired, negative effect on recovery and ultimate post-injury health outcomes. In part II, we will elaborate and explain the impact of compensation systems on the health of injured people in more detail. The impact of the compensation process on health is discussed based on the current health research.

3. The effect of the compensation system design

Compensation systems can be divided broadly into fault-based schemes (which are also termed common law or tort law systems) and no-fault schemes¹. The main difference is that in fault-based schemes a claimant needs to be not at-fault for the incident in order to receive

¹ Variations exist. In a pure scheme, the scheme is either no-fault or fault-based. In a hybrid scheme, the basis is either fault- or no-fault, to which respectively no-fault or fault-based elements are added. In a choice scheme, people can choose whether they want either a no-fault or a fault-based scheme (Fronsko, 2001).

compensation, whereas in a no-fault scheme a claimant will be compensated regardless of who was at-fault. Other differences will be described further on in this paragraph. Generally, fault-based schemes are more adversarial and less therapeutic compared to no-fault schemes (Lippel, 1999). The likely impact of compensation system design (fault or no-fault) on health is supported by empirical studies investigating health and disability of injured people involved in different compensation systems. For example, injured people who lodged a no-fault claim in Victoria, Australia, considered the compensation process to be fairer and reported better health status compared to injured people who lodged a claim in a fault-based scheme in New South Wales², Australia (Elbers et al., 2016). Compensation system design effects were also revealed in a study comparing Australian workers' compensation systems and time off work (Collie, Lane, & McLeod, 2015). Workers in Victoria had significantly longer durations of time off work (13 weeks' time loss) as compared to workers in Tasmania (7 weeks' time loss) (Collie et al., 2015). Another study investigated a legislative change in NSW, removing financial compensation for "pain and suffering" for whiplash, introducing clinical practice guidelines for whiplash treatment, permitting earlier acceptance of whiplash compensation claims, and earlier access to treatment for all types of injury in NSW (Cameron et al., 2008). These changes led to an 8% decrease in disability in injured people after a traffic crash (Cameron et al., 2008). Again, another study investigating a legislative change from fault-based to no-fault also showed a decrease in whiplash symptoms, which the authors mainly attributed to the removal of pain and suffering (Cassidy et al., 2000)

The negative effect of fault-based schemes on health is attributed to the fact that fault-based schemes involve more adversarial elements. The adversarial interactions mostly relate to the assessment of liability, medical examinations, determination of damages, and type of insurer (third-party or first-party; government or for profit). These adversarial interactions are elaborated upon below.

Liability assessment is the assessment, conducted by the insurance company, to determine whether somebody else is liable for causing the accident. In a fault-based scheme the injured person has to prove that someone else was at-fault for causing the accident, in order to receive compensation. The liability assessment can be stressful for the injured person, having to provide evidence, to which the insurance company can contest. Discussions can arise in case the circumstances of the accident can be unclear, or if the injured person is partly at-fault. This will lead to a proportionate reduction of the amount of compensation due. The liability assessment causes a delay, because it often can take up to 3 months to make a decision. In contrast, in a no-fault compensation scheme, compensation is available regardless of fault for the crash, meaning regardless of who caused the accident, so also for those who were at-fault. There are exceptions (e.g. injured people may not be eligible to claim compensation if they were involved in a criminal offence, such as drunk driving), but in general there is no discussion about liability in a no-fault scheme and the compensation process can start straight away.

² New South Wales has recently (2017) moved to a no-fault scheme

Medical examinations are another potential stressor. Medical examinations are conducted by medical assessors, to identify treatment needs, to establish the injured person's functional capacity for return to work, or to determine the degree of impairment once maximum medical progress has been achieved (Kilgour, Kosny, Akkermans, & Collie, 2015). Medical assessments can be requested by the injured person or by the insurance company. Particularly in medical assessments requested by the insurance company, injured persons can get the impression that the doctor is attempting to trick them and test everything in order to dispute their claim (Kilgour et al., 2015). Medical examiners can add a substantial degree of emotional stress and overtax the physical capabilities of injured people (Kilgour et al., 2015). This stress could lead to worse health and even increased mental and physical health care consumption (Elbers et al., 2013). In other studies, medical assessors were said to reinforce the sick role and exacerbate the trauma by over-investigating patients (Harris, 2007; Lippel, 2007; Littleton et al., 2011; Murgatroyd, Cameron, & Harris, 2011). It could be argued that medical assessments can be adversarial.

Assessment of damages involves determining the economic and non-economic losses that the injured person suffers because of the accident. Economic losses can be, for example, medical costs - although in some countries medical costs are covered by health insurance -, loss of income, transportation costs, or household support. In some jurisdictions, lawyer costs are also covered. Non-economic loss is primarily compensation for pain and suffering. In a fault-based scheme, people can claim economic *and* non-economic losses. In a no-fault scheme, injured people are often eligible to claim for compensation for economic losses only. In a fault-based scheme, economic losses are mainly individually determined, leaving room for discussion and negotiation, whereas in a no-fault scheme, economic losses are often pre-determined and calculated, leaving less room for discussion. More room for discussion can lead to polarisation and disputes between the injured person and the compensation agency.

A factor related to the assessment of compensable damages is the frequency in which the compensation is paid. In fault-based schemes, compensation is often paid as a lump-sum amount at claim settlement. In a no-fault scheme, compensation payments are often made intermittently (for example, paid every two weeks). Periodic payments may have a more positive influence on claimants' recovery compared to lump-sum payments (Grant & Studdert, 2009). One study found that claimants who received lump sum payments reported greater psychological disturbance and more unemployment than those who were paid intermittently (Greenough & Fraser, 1989). An explanation could be that lump-sum payments may involve a degree of financial insecurity and stress.

The final distinction is the type of insurer. Fault-based compensation schemes are typically third-party compensation schemes. This means that the injured person deals with the insurance company of the wrongdoer. No-fault schemes are typically first-party compensation schemes, meaning that the injured person claims at his/her own insurance company (Carroll et al., 2011; Fronsco, 2001). Third-party for-profit insurance companies have a stronger financial incentive to minimise the costs of compensation for the injured person, as the injured person is not their client. This may influence their actions. Injured persons might have less trust in for-profit, third-

party insurance companies, which could lead to poorer perceived fairness and more adversarial interactions (Elbers et al., 2016).

4. The effect of duration, litigation, and claim settlement

In addition to compensation scheme design, three other overarching compensation claim factors have been reported to affect claimants' health. The first is the duration of the compensation process. A long lasting compensation process is argued to be a factor causing psychological harm (Shuman, 2000). Another study showed that psychological distress in those with a musculoskeletal injury was associated with significantly longer settlement times (Guest, Tran, Gopinath, Cameron, Craig, 2017). Compensation processes take much longer than most people expect. On average, a minor claim can take one to two years (Gopinath, Elbers, Jagnoor, Harris, Nicholas... Cameron, 2016). A quantitative study empirically showed that being involved in a compensation process of longer than one year increased the trauma (Cotti, Magalhaes, da Costa, & Matos, 2004). However, in contrast, a meta-analysis of 211 studies did not find an effect of length of time on health (Harris et al. 2005).

The second overarching claim factor is involvement in litigation/court procedure. In general, the majority of the compensation cases are settled out-of-court. The matters that come to court are cases in which the dispute has risen, which may imply that these cases are more adversarial for injured people. However, the court can also have a positive effect on well-being, because of its procedural justice elements. One study showed that people who were involved in litigation processes were more traumatised than those in out-of-court settlements (Cotti et al. 2004). A meta-analysis analysing 211 studies, however, did not show a health difference between claimants in litigation procedures and those involved in out-of-court settlements (Harris, Mulford, Solomon, van Gelder, & Young, 2005).

Thirdly, it is frequently suggested that a claim settlement can have an effect on health. Claim settlement has been reported to 'cure' the victim (Miller, 1961), implying that once claimants receive their compensation, they miraculously recover from their injury. Some studies indeed found supportive evidence, as some showed that people with settled claims reported better health compared to those with pending claims (Guest & Drummond, 1992), whereas other studies did not show a correlation between claim settlement and mental health or recovery (Blanchard et al., 1998; Mendelson, 1995).

5. The effect of legal professionals involved in the compensation process

Empirical studies also suggested that legal professionals may have a negative effect on the claimants' well-being. Two major types of legal professionals are involved in the compensation system: lawyers and claims managers³.

³ The term 'legal professionals' is used to indicate professionals that are involved in the compensation settlement. Used in that way, claims managers are legal professionals; they not always have a legal background

The compensation process is an out-of-court process, for which it is not required to involve a lawyer. It could be assumed that most lawyers get involved because a dispute arises, or because people need help and expertise in an unfamiliar procedure. However, according to recent research among claimants in the Netherlands (n=12,679), the main reasons why injured people have legal assistance is because they were insured for it (42.5%) (Becx, Elbers, Van Wees, Leferink, Akkermans, unpublished document). The involvement of lawyers varies. For example, 13% of claimants involved a lawyer in the no-fault scheme in Victoria versus 67% of the claimants in the – at that time⁴ – fault-based scheme NSW Australia (Elbers et al., 2016). Interestingly, several studies found that lawyer involvement is negatively associated with claimants' well-being (Gun et al., 2005; Harris, Murgatroyd, Cameron, Young, & Solomon, 2009). One study did not find an association (Casey, Feyer, & Cameron, 2011). Explanations why lawyers are associated with worse health outcomes also vary. Some researchers suggest that lawyer involvement is associated with poorer health, because people with more severe injuries are more likely to involve a lawyer. However, studies that controlled for injury severity still found a negative effect (Harris, Young, Rae, Jalaludin, & Solomon, 2008). Others suggested that lawyers implicitly may encourage their clients to maintain sickness behaviour (Aurbach, 2011), or that lawyers inflict harm by not taking into account their clients' emotions and non-material needs sufficiently (Akkermans, 2009).

The other major category of professional in the compensation process is the claims manager. Claims managers are directly in contact with the injured person, unless a lawyer is involved. Claims managers often fulfil the role of critical decision-making. They make an assessment as to whether they approve a requested treatment, they determine (duration of) income replacement payments, and whether the injured person is eligible to get other services. Several studies have investigated the effect of claims management actions on patient outcomes. The most comprehensive evidence comes from a systematic review on the interaction between injured workers and insurers (Kilgour, Kosny, McKenzie, & Collie, 2014). In the above review it was shown that claims managers were most often associated with having a negative impact on the claimants' health (Kilgour et al., 2014). Injured people often considered the interaction with the claims manager adversarial, for example because they felt that the claims manager did not take them seriously, did not listen to their story, and did not treat them with respect (Elbers, Akkermans, et al., 2015; Kilgour et al., 2014). Injured people were shown to develop a strong sense of injustice by having to justify themselves and having to prove that their injuries are real, being subjected to various medical exams and private investigators (Grant, O'Donnell, Spittal, Creamer, & Studdert, 2014). Also, the lack of communication (for example, not answering phone calls) or using difficult jargon in their letters has been found to be stressful and harmful (Elbers, Akkermans, et al., 2015; Kilgour et al., 2014). People can feel financially dependent on the system. Financial dependency worsened when claims managers ceased, changed or made late payments without notifying the injured people (Elbers, Akkermans, et al., 2015; Kilgour et al., 2014). However, Kilgour et al (2014) also found that claims managers can have positive effect on claimants. This was when injured people found their claims manager to be respectful

⁴ The study was conducted in 2015. In 2017 NSW has changed to a no-fault system.

and understanding, providing continuous contact and personalised service, receiving clear explanations and answers to questions, timely payment of income benefits and payments to medical providers, and prompt referrals for medical services and re-employment assistance, adopting a supportive problem-solving approach (Kilgour et al., 2014).

Other evidence of how claims management can have a positive impact health comes from intervention studies. The first published study that investigated the impact of a change in claims handling on the health of injured people is a study conducted in NSW (Schaafsma, De Wolf, Kayaian, & Cameron, 2012). The change in claims handling consisted of, among others, better communication, early intervention, psychological screening, and focusing on early return to work. The study showed that an improved claims handling resulted in injured people being more likely to go back to usual activities 7 months post-traffic injury (Schaafsma et al., 2012). At a conference on injury compensation schemes in Adelaide in 2015, several non-academic studies were presented showing an effect of changes in claims management. For example, in South Australia, a new proactive claims management strategy ('how can I help you?'), including mobile case management, early intervention, and legislative reform resulted in a 30% improvement in health and return outcomes in injured workers (G. McCarthy, 2015). In another study, simplification of communication, such as reducing the amount of text, moving legislation to the back of letters, removing unnecessary letters, consistent messaging focusing on recovery and returning to work, and asking workers to make personal commitments to support their return to work, resulted in 27% RTW improvement overall in injured workers (Smith, Collins, & Qiao, 2015).

III. THE FUTURE OF COMPENSATION SYSTEMS

Finally, what is the future of compensation systems? What are the methodological advances to accurately test compensation systems and policy implications in the future? Based on the research about (best practice) scheme design, the ideal scheme is being presented.

6. Methodological advances and policy implications

There are considerable ethical and practical challenges associated with research in applied injury compensation and rehabilitation systems. Firstly, the sheer complexity of services, legislation, injuries, and individual circumstances of people who pass through them mean that comparison of 'treatment' and 'control' groups is difficult; road injury can strike almost anyone and the mental and physical injuries sustained are often diverse requiring vastly different financial and time resources to treat. Secondly, from a policy or management perspective, there are restrictions on what is possible to provide within legislative boundaries that govern the system. Finally, identifying and quantifying the effect of key management settings to which improvements or detriments in performance can be attributed is also difficult. As a simple example, a rehabilitation system with a total of just 20 management policies or processes, each with three potential settings has 3^{20} , or nearly 3 and a half billion potential policy combinations it could test.

While we now know how damaging particular interactions with injury compensation and rehabilitation can be, there remains scarce publicly available evidence related to the effects of changing system processes or design. This may be due to a few reasons. 1) Insurance companies may not be keen to have their practice changed, 2) they *do* change their practice but do not adequately investigate the effect on injured person's health, or 3) they do investigate the effect of scheme design and processes on outcomes but do not publish their findings due to commercial or other reasons. This last point is understandable from an individual company's perspective, however, if knowledge of successful practice interventions can also be applied to others through more open and accessible communication of results, then companies, injured people, and the broader community all stand to benefit. Despite these challenges, there is a need for more intervention research and the development of innovative research designs that can assist to answer questions related to the health impacts of various compensation and rehabilitation system policy, management and intervention scenarios. Fortunately, a number of innovative research projects and programs have recently been enacted, with encouraging results.

One recent innovation comes from the field of computational social science where simulated compensation and rehabilitation systems have been generated (Thompson, McClure, & DeSilva, 2017). Termed 'SimSchemes', these virtual policy and management laboratories have been co-designed with compensation and rehabilitation system managers and developed using agent-based modelling to enable various policy directions and scenarios to be tested in a safe, off-line environment. Recently applied to a 'no-fault' scheme in Australia, Thompson et al. (2017) tested the performance of the SimScheme in response to a set of 9 policy scenarios to determine short, medium and longer-term effects on a population of injured clients across health system performance principles described above; responsiveness to client expectations, fair financial contribution, and overall population health (see Figure 2). The 9 policy scenarios tested were:

- 1) Improving the effectiveness and quality of services available to patients through payment for 'premium' healthcare where effectiveness increased alongside investment;
- 2) Reducing approval rate of services by rehabilitation coordinators (i.e., reducing the approval rate of requested services by rehabilitation coordinators from 90% to 70%);
- 3) Early intervention (i.e., rehabilitation coordinators actively sought out patients with claim durations of < 30 days in order to provide access to services sooner);
- 4) Improving patient access to health services (i.e., increasing the number of existing services that accept compensable patients from 80% to 100%);
- 5) Improving road safety (i.e., reducing incoming patients through investment in increased safety measures resulting in 10% reduced road trauma);
- 6) Improving availability of rehabilitation coordinators (i.e., increasing numbers of rehabilitation coordination staff by 10% from 300 to 330);
- 7) Increasing pre-approval rates (i.e., doubling the number of services that could be pre-approved for patients from 12 to 24 before being required to return to rehabilitation coordinators to request further treatment);
- 8) Reducing eligibility of services (i.e., increasing the threshold of injury severity for patients being eligible to receive services from the insurer);
- 9) Do nothing (i.e., no intervention).

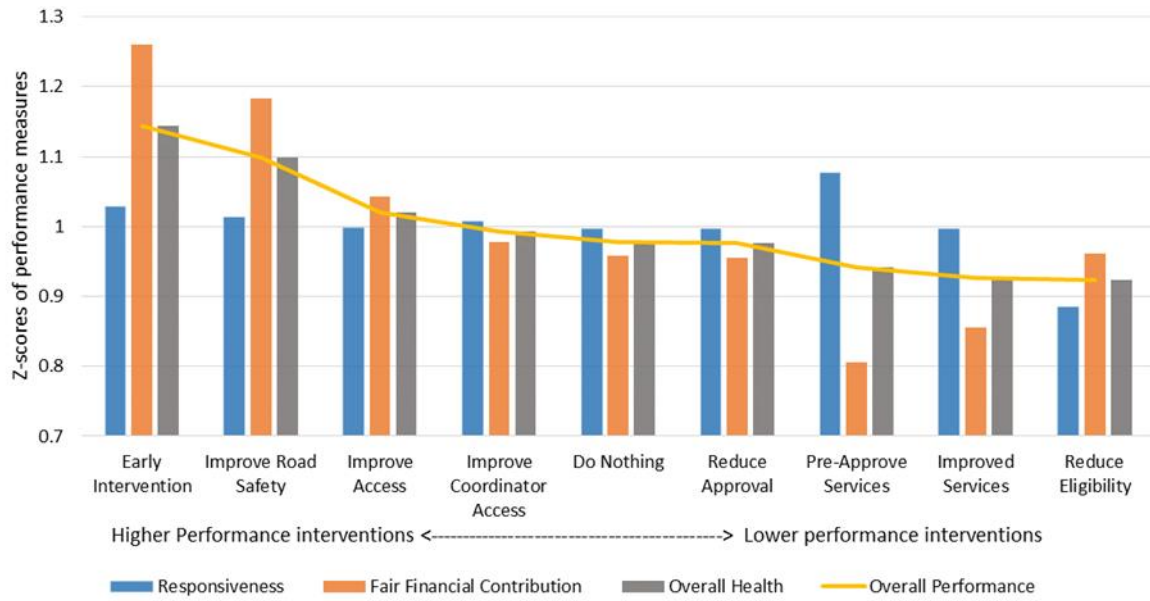


Figure 2. Overall performance of SimScheme system at simulation conclusion across elements of responsiveness, fair financial contribution, and overall health under each policy scenario, ranked from left to right in terms of effectiveness.

The value of these models appears to be delivered in 3 main areas. Firstly, the flexibility of the models enables scheme managers and policy makers to model multiple interactions and proposed effects that extend over time and far beyond what can be reasonably imagined or thought through by any individual person or team (Sterman, 2006). In this respect, the model can act as a means of intelligence amplification (Vinge & Euchner, 2017) for decision-makers, where the combined expertise of contributors to the model design can be combined and considered in one schema. Similarly, it enables the consideration of various system performance criteria to be monitored at the same time, throughout the running of the model. This enhances understanding by various system participants of trade-offs or compromises that high performance in individual parts of the system may have on alternative aspects of measured performance. A simple example relates to the reduction of recovery durations among injured clients. By simply increasing the injury severity thresholds that clients require to receive on-going medical treatment paid for by the simulated compensation system, immediate benefits can be observed in average durations of care. Whilst this produces a short-term financial benefit, ultimately, the system is left with a cohort of clients with even poorer health, who have longer durations of care on average, who are less satisfied with the services they receive, and who have higher per-person medical care costs. Total scheme performance is therefore compromised.

The second advantage appears to be in the co-design element of the model, itself. Working closely with scheme managers, the computational models often require implicit assumptions of ‘how the system works’, to be made explicit for the model to run. This process requires either agreement or understanding to be reached by managers who may have not previously realised

they understood the system to operate differently from one another. Alternatively, if consensus cannot be reached, it enables experimentation to be performed under the explicit working hypotheses of each manager or group. When differences of opinion or knowledge gaps are revealed through this process, this can further lead to identification of areas for investigation by more traditional means.

Lastly, results provided by the models often provide insight into unusual system behaviour that cannot, could not, or was not predicted ahead of time through analysis of model inputs, alone. Examples from Thompson et al. (2017) relate to the initial short-term degradation of key system performance metrics that then corrected over time. For example, while two policies of early intervention and providing early access to care in the simulated system were expected to reduce mean client recovery durations through ensuring simulated clients received the timeliest treatment possible, initial measures immediately after policy implementation indicated that mean recovery durations for the overall population increased (see Figure 3). So why did providing early intervention and access to care initially increase the mean recovery durations of the overall population?

In hindsight, this system behaviour was easily explained; clients with short claim durations were exiting the system, leaving only those with long durations behind. With a higher proportion of ‘long tail’ clients in the system, the mean recovery durations were pushed higher. However, without the modelling exercise providing a preview of likely effects on overall system performance, initiation of a similar policy in a ‘real’ system alongside like performance decrements may lead managers to believe that such policies were doomed to fail before they had sufficient time to play-out.

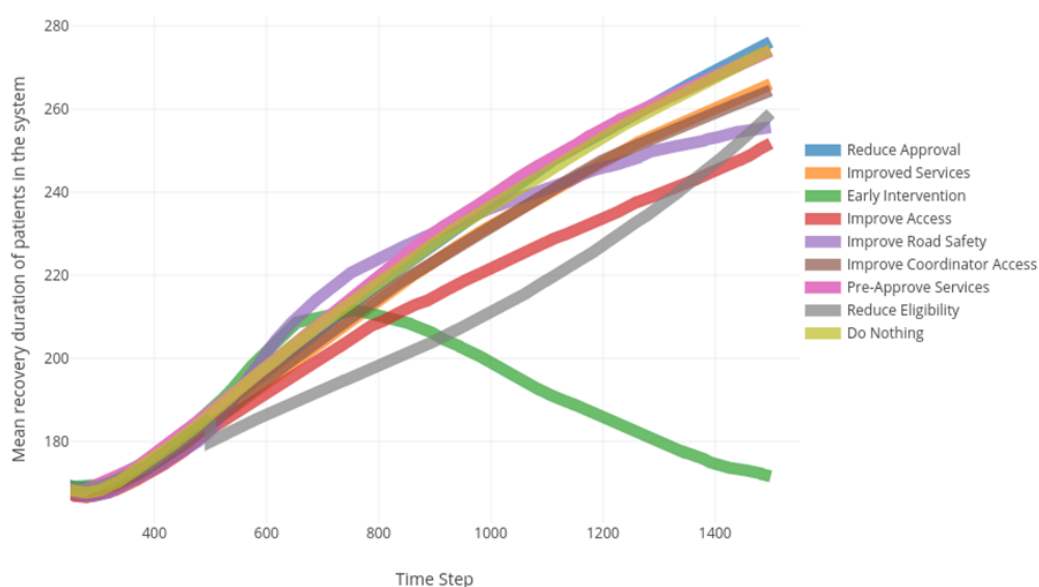


Figure 3. Mean recovery duration among patients in the simulated health system from time-step 250 to 1500 under each policy scenario.

The potential of such low-investment, system-oriented models using agent-based or other techniques such as system dynamics to reduce uncertainty (Milliken, 1987) or amplify intelligence in decision-making, is compelling. This may especially be the case within real-world compensation and rehabilitation systems where executives and managers often cannot wait for the conclusion of longitudinal studies, natural experiments, or medical or treatment trials to take place before taking action. Whilst far from providing a crystal ball view into the future, when fueled by a combination of established empirical evidence and local-level expertise, transparently built, tested, replicated, challenged, recorded, and iterated models such as SimScheme may prove themselves useful (Box, 1976; Epstein, 2008) in designing ideal schemes of tomorrow.

7. Ideal scheme

The design of an “ideal” scheme is important as an example of what might be achieved to assist recovery of people injured in motor vehicle crashes. However, it is recognised that insurance schemes do not exist in isolation from other systems and factors that also influence health. The reality also is that an “ideal” scheme design will not be seen as ideal by all stakeholders and will be resisted through political or corporate processes. In addition, schemes with good qualities are usually eroded over time and become financially non-viable. As a result, there is change that can be positive but can also be negative based on prevailing political factors.

It is generally accepted that an “ideal” scheme would encourage early treatment and return to usual activities (including work). Thus, it is likely to be “no fault”, because if fault is to be determined, it will be more adversarial. Guidelines should be in place to provide appropriate treatment with a minimum of delay, for example through pre-approval of evidence based treatments. Guidelines should also aim to limit access to treatments that are clearly not effective or are likely to be associated with greater, or longer periods of, disability.

Early treatment would also be encouraged by early notification, that is, a claim is made soon after injury. Claims management practices would be structured to ensure clear and timely communication with injured people. As far as possible, dispute resolution processes should be seen as fair, and formal disputes should be avoided through informal resolution processes. An ideal scheme should also manage those with psychological disorder in a more professional manner, applying early screening and offering early access to evidence based treatment (Guest, Tran, Gopinath, Cameron & Craig, 2018).

The “ideal” scheme should also have (or lack) other characteristics that may be considered controversial. Non-economic loss payments (that is payments for “pain and suffering”) should not be part of the scheme, or should be subject to high thresholds so that only a small percentage of claimants will reach those thresholds. High lawyer activity within a scheme is also likely to extend the duration of claims and hinder recovery. Thus, there should be regulations that limit lawyer activity, perhaps only to people with very severe injuries, or to cap the fees that lawyers can charge. The reasons to limit lawyer activity are to reduce adversariality and to limit explicit, or implicit, incentives to greater disability. Further, high degrees of lawyer activity should be

avoided on the account that it can create ‘lock-in’ where positive policy change for injured clients is potentially hindered by perceived threats to existing legal business models.

For an “ideal” scheme, economic loss payments also should be set at levels that are fair but also encourage return to usual activities, particularly work, as soon as is feasible. The reason is that returning to work, or usual activities, is internationally accepted as being positive for health. There are a wide variety of levels of income replacement specified in different insurance schemes. In general, it is accepted that there should be close to full income replacement for a period of about three months after injury and then a significant step down (often to 80% of usual income) to encourage return to work. Special arrangements are usually put in place for people with very severe injuries.

As has been noted earlier in this chapter, there is very limited direct research evidence about what can be done to assist schemes in achieving better outcomes for injured people. Hence, while general characteristics of better schemes can be defined, there is uncertainty about the relative impacts of different factors related to an ideal scheme.

8. Conclusions

In these final years of the Decade of Action for Road Safety, compensation and rehabilitation systems have an opportunity to optimise their design. Consistent with WHO guidelines for the effective management of broader health systems, this requires the enactment of settings and structures that optimise the physical, mental and functional health of injured clients, maximises the responsiveness of systems to clients’ non-medical needs, and ensures the ongoing financial sustainability of compensation and rehabilitation systems. However, we contend that presently, there is undue emphasis placed on the latter of these components and a re-balancing of the purpose of injury compensation and rehabilitation systems to focus on the rehabilitation needs of injured clients is required. Presently understood within a largely ‘defensive’ insurance model that attempts to restrict outgoings on the basis of longer-term liability risk, we advocate that future models can re-orient themselves toward a more ‘active research and rehabilitation’ mindset, placing the client at the centre.

It must be acknowledged that regulators and insurers will always face competing pressures of costs, governance, and service capacity. There is always more that can be done, and more that is being asked of insurers than can ever be delivered. However, schemes and rehabilitation system researchers can work together to explore what optimal compensation schemes would look like under these difficult conditions. We contend that managing financial sustainability through early identification of vulnerability, early intervention, and efficient, uncomplicated delivery of services, rather than their curtailment, delay or denial, is a good beginning. It is also highly encouraging to see some systems (Victorian Transport Accident Commission, 2016) beginning to embody these principles. Also New South Wales recently adopted a no-fault system, which may be less adversarial and could lead to better health outcomes.

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